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## Chapter 2

# A PSYCHOLOGICAL VIEW ON INDUSTRIAL TRANSFORMATION AND BEHAVIOUR

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**Abstract:** This paper argues that psychologists are only beginning to understand how global environmental issues may be related to the ways people create a 'fit' between themselves and their environment in order to survive. The notion of a person-environment fit is an analogue at the personal level of the concept of sustainable development at the level of society. Using knowledge from a wide range of behavioural disciplines (i.e. psychology, sociology, anthropology, history) the author presents a cascade-like framework that sorts influences on a person's behaviour into a logical order. The framework combines perceptual and rational processes internal to the person with social, organizational, and distal processes (i.e. long-term causes). Two psychological processes are discussed in greater detail to highlight the role of personal values and the process of becoming mindful of changes in the environment.

**Key words:** Behaviour, distal and proximal causes, values, awareness, person-environment fit

## 1. INTRODUCTION

What is a transformation from a psychological point of view? When psychologists say that someone has undergone a personal transformation, they mean that he or she has changed in more than one way. For example, the transformation from being a smoker into being a non-smoker is not just a matter of putting out a cigarette. The transformation involves all the changes that are connected with being a smoker, such as specific acts, beliefs and

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feelings about one's identity as a smoker and commitments to the world of smokers, including the tobacco companies. The person who quits the habit has to replace these elements with other acts, another identity and new commitments to the world of non-smokers. In sum, a transformation is more than just a change in a person's behaviour — it is a set of related changes. Although some of the changes may be planned, others have to be learned in the process of changing.

The transformations this paper aims to discuss are more than personal transformations, because they refer to potential changes at the level of society, such as a significant shift in diet from animal proteins to plant proteins. Psychologically speaking, such changes to a more sustainable diet are heavily dependent on consumer behaviour, although the behavioural change may not always be so personally involving as the case of smoking suggests. Moreover, a transformation at the level of society may also be dependent on workers' acceptance of a new technology and citizens' political choices. It is the relationship between Industrial Transformation (IT) and these types of behaviour (i.e. consuming, evaluating, voting) that this paper will focus on.

Given the breadth of IT, it is necessary to choose a broad behavioural approach that goes beyond studies into specific environmentally related behaviours, such as recycling (e.g., Diekmann & Preisendörfer, 2003; Tanner & Wolfig Kast, 2003). Another important consideration is that it was only two decades ago that experts started to think about global environmental issues, and since the concept of sustainable development was introduced. Many people in Western countries spent their formative years in a period of increasing affluence and consumerism. Therefore, a broad behavioural approach should start with a closer look at the relationship between people and their environment, and put this relationship in the perspective of changes that occurred during people's lifetimes and beyond. Such an approach may help to clarify the most important messages that psychologists have for other scientists in this field.

One of those messages is that human behaviour is a very flexible phenomenon and that each particular manifestation of it can be the result of many determinants. The notion that human behaviour is flexible becomes particularly clear when we take an evolutionary perspective. Complex behaviour is a relatively new phenomenon that is closely connected with evolution (Cziko, 2000). The behavioural patterns of the early species were rather fixed and predictable (e.g. plants grow towards the source of light) but the patterns of later, more complex species have become far more varied and flexible (e.g. animals living in groups). As a result of being particularly flexible, groups of humans have been able to adapt to very divergent environmental conditions, varying from snow-covered hunting grounds to so-called High Reliability Organizations, such as space shuttles (Weick et

al., 1999; Whiteman & Cooper, 2000). In their respective settings, the hunter and the astronaut show extremely different behaviour, but they must both maintain a proper 'fit' between themselves and their environment in order to survive.

The notion of a person-environment 'fit' refers to a balance between, on the one hand, a person's values, capabilities and perceptions, and, on the other hand, the opportunities and demands of his or her environment. This personal 'fit' is analogous to the concept of sustainable development at the level of society. Particularly relevant here is that even though people may be more concerned about a 'livable' street (Appleyard, 1981) than about a 'livable' planet, they are not indifferent towards the way in which their welfare is generated (Bramwell, 1989). The initially successful storyline of a 'global nature' under threat and in need of protection from a global imagined community, however, has lost its appeal among the citizens of Western countries (Macnaghten, 2003). In their eyes, such a storyline is too simplistic.

In view of people's scepticism about the motives of those who propose simple solutions, it becomes increasingly important to obtain more insight into how global environmental issues may be related to the person-environment fit. Two psychological processes are particularly relevant in this context. The first involves the values that people internalise when growing up in a particular community (Schwartz, 1992). For example, a person who has learned to feel respect for the natural forces and hazards to which he or she is subject will feel rather uncomfortable in a setting where nature is being destroyed. The second process refers to people's awareness of changes in their environment (Langer, 1989). The examples of the hunter and the astronaut mentioned above show that both of them must be extremely mindful of unexpected changes in their environment. Alternatively, in a more relaxed context, people may find pleasure and satisfaction in being mindful of a good fit with their environment.

In the next section, I discuss the various determinants of behaviour by presenting a cascade-like framework that sorts them into a logical order. Then, I briefly examine the role of values and the process of becoming mindful of changes in the environment. In the final part of the paper, I shall explain that any behaviour-related intervention to support IT can only be successful if it contributes to a better person-environment fit.

## **2. ON THE CAUSES OF BEHAVIOUR**

In considering the causes of a person's behaviour, it is important to take into account that any act is the result of multiple determinants. These determinants can be sorted into a logical order on the basis of two general

notions. The first one is that it makes sense to consider, from a behavioural perspective, the time it takes to create or develop certain actions and phenomena. For example, a genuine problem cannot be solved in one second and a friendship cannot be built in an hour. These time limits say something about the underlying processes. The second notion is that any causal factor can only take hold in a certain context. In other words, a virus can only cause an illness among those persons who are not immune to it. The context, in turn, is also dependent on other causal factors, such as vulnerability to the virus as determined by heredity.

Apart from strictly biological phenomena, the most obvious determinants of behaviour are the perceptual and rational processes that enable a person to adapt his or her activities to the situation at hand. These adaptive processes refer, for example, to the taste of a food and the person's ideas about its origin. If a person is in doubt about the quality of a food served by a host, his or her behaviour may be influenced by personal loyalties to this host. Also relevant might be the person's thoughts about the business practices that are common in the food supply chain. In short, the behaviour in question is not only a function of processes within the person, but also of social and organizational processes that act as 'proximal' causes of behaviour.

Moving from processes that are internal and proximal (i.e. short-term causes) to more distal processes (i.e. long-term causes), we can see determinants of behaviour that will not dramatically change during the lifetime of an individual. These relatively stable processes can influence the person tasting the food, if, for example, he or she is drawn to beliefs about purity and danger that result from broadly shared worldviews (e.g., philosophies of life, beliefs about magical powers). These worldviews have gradually changed over the past millennium, due to a process of cultural modernization (Levine, 2001). Unlike mediaeval men and women, modern people will not expect solutions from magical powers but they may still be sensitive to some of these beliefs under conditions of uncertainty.

A final category involves evolutionary processes, which have shaped human capabilities to cope with the environment, for example the ability to make a quick distinction between sweet (i.e. rich in calories) and bitter tasting (i.e. possibly poisonous) foods.

The processes mentioned above can be arranged in the cascade-like framework shown in Figure 1. The framework is relatively new, although similar ideas have been put forward by others (Diamond, 1999; Newell, 1990; Oyserman et al., 2002). The highest level refers to evolution of life. One of the results of evolution is that humans are able to distinguish between positive and negative stimuli in about 100 milliseconds (Smith et al., 2003). Another relevant feature with an evolutionary origin involves the response strength of brain systems. The brain systems responsible for evaluating negative stimuli respond more strongly than those responsible for evaluating positive stimuli (Smith et al., 2003). This so-called negativity bias means

that negative stimuli (e.g. a suspect bitter taste) have a greater impact on information processing than do positive stimuli.

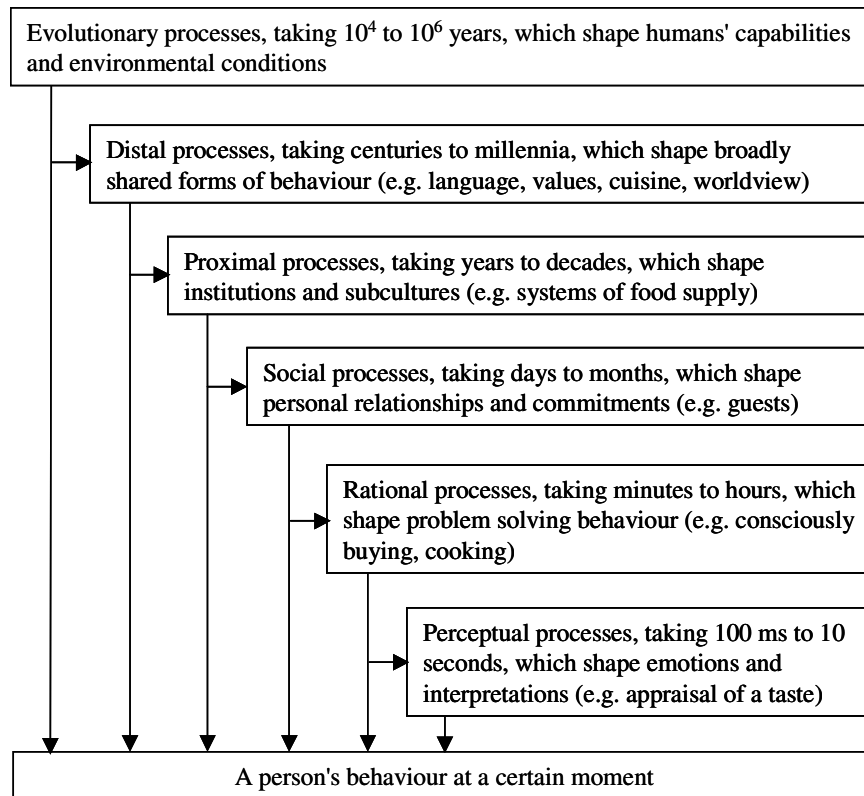


Figure 1: A cascade-like framework of influences on behaviour

The next level of Figure 1 refers to distal processes that have shaped broadly shared forms of behaviour over centuries or millennia. These include the rise of practices, values and worldviews that are typical of modern culture in the Western world. Put simply, the ‘modern’ period started in 1900 and modern Western societies can be distinguished from their predecessors by their potential to democratise both wealth and political processes (Levine, 2001: 11). The overall concept of modernization covers a number of more specific processes, such as the growing importance of an ‘engineering culture’ characterized by the systemic application of scientific knowledge to societal issues (Carroll-Burke, 2001). This engineering culture produced the steam engine and many other things that account for the present welfare.

By their very nature, distal processes like modernization have created both opportunities and constraints for the development of institutions and subcultures that belong to the proximal processes of Figure 1. These

processes include the development of food supply chains and professional cooking that are heavily dependent on occupational cultures. According to Schein (1992: 12), such a culture may be seen as a pattern of shared basic assumptions that a given group (or organization) has learned as it solved problems of external adaptation and internal integration. This is in agreement with the more general notion of culture as a set of coordinated practices that creates incentives and disincentives for the behaviour of the people involved.

The social processes in Figure 1 are more personal than the professional activities mentioned above, and take much less time to develop. For example, a person's loyalty to a colleague may grow in a few days or months. According to Newell (1990: 494), it is characteristic of social situations that there are multiple, somewhat independent goals present at all times. In a task-oriented group, for example, each person cares (1) about the task the group is performing, (2) about maintaining the social atmosphere of the group, and (3) about his or her own position in the group and the personal satisfactions of group membership. Regarding each of these goals, the person has an impact on the outcomes but he or she is also dependent on the other group members.

The processes mentioned above are external to the person, except for the social processes, which are a mixture of external and internal elements. The lowest levels of Figure 1 refer to processes that are internal to the person. The rational processes, often taking minutes to hours, include conceptual learning, problem solving and decision-making. Notably, Figure 1 shows that a person's behaviour is not fully determined by rational processes. For example, even if a person aims to take a decision in a purely rational way, he or she will soon find that social commitments and perceptual biases can interfere with such an approach as soon as the decision's consequences become serious.

Perceptual processes shape a person's rapid interpretations of situations and his or her subsequent emotional experiences. An important distinction at this level is that between mindless and mindful processing. Psychological research has shown that people who are generally capable of acting mindfully can actually perform seemingly complex tasks with little if any active mental involvement (Langer, 1989). This means, among other things, that they rely on routines developed in the past and that they do not make new distinctions to accommodate any changes of the task environment. In contrast, mindfulness is essentially an awareness of contexts. Without this awareness, a person cannot improve his or her performance, self-esteem or health (Langer, 1989). I will come back to this point later.

One of the notions behind the framework of Figure 1 is that the more distal factors provide the context in which the more proximal or internal factors can have their effect. This notion is particularly relevant for the impact of culture on behaviour. For example, the process of modernization has enabled modern people to understand that disasters, such as floods, are

not the result of magical forces, but of natural phenomena that can be analysed in terms of causes and effects. Under these circumstances, people have become more receptive to science-based advice on sustainable development, although they have also learned that modern scientists have their own interests in certain issues (Giddens, 1991; Macnaghten, 2003).

An important practical message of Figure 1 is that it is not necessary (if feasible) to change a culture completely in order to change a particular behaviour. The example of smoking shows how this might work. During the years 1910–1919, the American tobacco companies could rapidly increase the number of male smokers by using strong appeals to the culture of the American male (e.g. the Camel campaign); in later years, they also developed special campaigns for women (Pierce & Gilpin, 1995). Since the mid-1960s, however, other dimensions of this same American culture have been used in attempts by the social/health movement to ban smoking. New evidence revealed in 1986 that smoking was also life threatening for the people who shared the smoker's environment, contributed to the successful moralization of smoking as behaviour that is unhealthy to others (Katz, 1997). In sum, the number of smokers could first go up and then go down without dramatic changes in the core values of the people involved.

The rise and fall of smoking demonstrates that the achievement of specific policy objectives (e.g. selling cigarettes or promoting health) can be aided or hampered by appeals to well-chosen values within the broader culture. These appeals have also been effective in the workplace, where people are or are not allowed to smoke. Prohibitive rules and disapproval by colleagues have finally inhibited the behaviour of potential smokers. This example shows that the impacts of an organizational culture and the social relationships at work might to a certain degree be in accordance with the broader culture. Such congruence between various causes of behaviour, however, cannot always be expected.

The lower level processes of Figure 1 are building blocks for the higher ones. For example, a non-smoking policy in the workplace will not succeed if an employee can mindlessly light up a cigarette without any negative feedback (i.e. level of perceptual processes). The policy will also fail if the employee consciously tries to evade the rules (i.e. level of rational processes) or strives to transform the rules by organizing protest meetings (i.e. level of social processes). The notion of building blocks does not mean, however, that an individual can fully understand how his or her behaviour contributes to social relationships, organizational cultures and long-term cultural changes.

The framework can help to diagnose the options for a behavioural change. First of all, it is important to gain insight into the congruence of the various influences on behaviour. The example of smoking shows that the effectiveness of interventions will increase if all the influences on a particular behaviour point in the same direction. The framework also helps



in considering the role of time in diagnoses and interventions. The fact that the various influences on behaviour have their own pace has consequences for the diagnosis of present influences and for the design of an intervention. The pace of change will depend on the type of process to be changed. For example, it may take less time to increase the practical knowledge of consumers than to improve the social status of novel products.

Finally, it is necessary to underline the worth of a thorough diagnosis. If IT requires a behavioural change, the diagnosis will be an essential tool. The aim of the diagnosis is to specify the discrepancies between current practices and desired practices as a starting point for behaviour-based interventions, such as health and safety promotion. It is beyond the scope of this paper to discuss the various types of behaviour-based interventions. See, for instance, Geller (2001) for an excellent overview. Interestingly, many interventions try to modify a person's awareness of the values that he or she thinks are important in a given situation. This issue will be pursued below.

### **3. THE ROLE OF VALUES**

Care about 'safety' and 'health,' respect for 'nature' and 'other people,' but also 'pleasure,' 'power,' and 'true to tradition,' are examples of the values that may guide a person's relationship with his or her environment. Values are defined as standards or criteria with which people make evaluations (Rokeach, 1973). For example, any time a person has to make a choice between a traditional 'heavy' meal and a modern 'light' meal, he or she may show the belief that one of these options is personally preferable to the other. A person's value system is his or her set of beliefs concerning preferable modes of conduct (e.g. 'true to tradition') or end-states of existence (e.g. 'healthy') along a continuum of relative importance.

Values can be studied at several levels of the framework presented in Figure 1, depending on the kind of topics that are addressed. For example, sociologists are interested in values at the level of institutions. Ethnographic investigators tend to emphasize the relatively unique cultural meaning of the criteria that specific groups, such as those believing in macrobiotics, use in a given social context. In contrast, social psychologists are more oriented to the activities of ordinary individuals; they seek to identify evaluation criteria and value structures that can be applied to, for example, the workplace or the household, but can also be generalized to a wider set of situations. This last approach is chosen here.

In this section, health and safety will be taken as examples of personal values. These topics have recently been put forward in an OECD report on environmental strategy in which the need to address the social and environmental interface of sustainability is emphasized (OECD, 2001).

Interestingly, health and safety are values with both traditional and modern meanings. As a result of the process of modernization and the democratisation of wealth (see the previous section), health and safety have become symbols of valued states of mind that imply more than just the absence of illness or injury. What these symbols currently mean can be better understood when we place them in the context of other values that are important in people's lives. Several of these values can help to increase a person's awareness of health- and safety-related issues. Others, however, can hamper this process and contribute to avoidance reactions.

The notions of evaluation criteria and value structures build on the pioneering work of Maslow (1954) regarding the organization of human motives. Maslow saw this organization as a hierarchy of basic needs, with self-actualisation at the top. He suggested the following list, proceeding from the lowest order to the highest: (1) the fundamentals of survival, including hunger and thirst, (2) safety-concern over physical survival, (3) desire to be accepted by intimate members of one's group and to be an important person to them, (4) desire to achieve a high standing relative to others, including desires for mastery, reputation and prestige, and (5) self-actualisation – a desire to know, understand, systematize, organize and construct a system of values. Maslow's idea was that each higher order of motive will not function until lower levels are satisfied, at least to some degree. Conversely, this idea implies that safety-concern might be overlooked when striving to satisfy hunger or thirst, but not in striving for any of the higher-order motives (i.e. safety first).

Maslow's work has become popular because he is one of the writers who emphasize self-actualisation in the context of conditions and prerequisites for living a satisfactory human life. This, however, is more a cultural vision than a psychological theory. Severe hunger or fear indeed have dominating effects on behaviour, but there is little clear evidence for the differential effects of the other levels of Maslow's hierarchy. One of the problems with his ideas is that they imply fixed categories of motives. For example, the position of safety in the hierarchy depends on how it is conceived; this raises the question whether the childish need for security measures should be placed into the same category as the self-confident way in which an adult copes with risks. Instead of postulating fixed categories of motives, however, it is more fruitful to examine how people actually construct evaluation criteria and value structures.

From this perspective, it is possible to examine relationships between relatively abstract values, such as a general preference for 'security,' and more concrete values linked with a subset of situations, such as using 'self-protection' as a choice criterion in the workplace or the household. Research into consumer behaviour (Allen & Ng, 1999) indicates that values can have two kinds of impact on choices: a person's values can provide (1) motives for a product choice (e.g. why should he or she buy a product that promises self-

protection?) and (2) criteria that enable him or her to compare alternative products (e.g. which product?). In other words, values are relevant at the level of rational choices and they increase the person's sensitivity for value-related cues at the level of perceptual processes.

A highly relevant research program on values has been organized by Schwartz, who initiated a series of multinational studies on the values people find important in their lives (Schwartz, 1992; Schwartz & Sagie, 2000). To ensure that the surveys in the various countries were comparable, the populations sampled were teachers or students (i.e. predominantly middle class samples). Their ratings of the importance of 56 values were analysed by looking for values that seem to go together and values that lead to contradictions. Partly drawing on theory, Schwartz (1992) came up with 10 main groups of values that can be arranged along two axes (see Figure 2). The adjacent regions in Figure 2 show values that can go together, while values in the opposing regions may lead to contradictions.

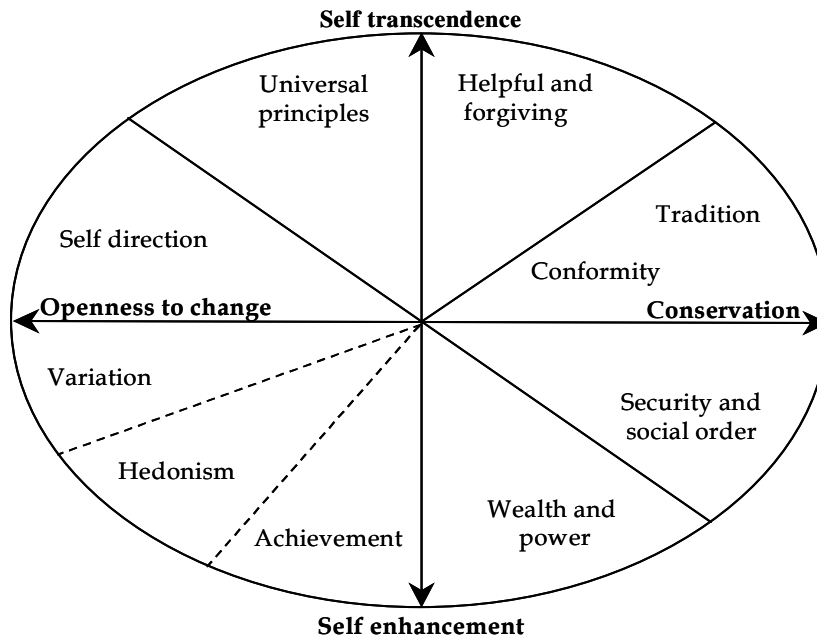


Figure 2. Main groups of values that people may or may not find important in their lives, arranged along two axes (Adapted from Schwartz, 1992).

The horizontal axis of Figure 2 may be particularly relevant for IT, because it is characterized by a dichotomy between being open to change versus being conservative. The openness to change relates to a number of values that go together well and are related to the desire to give one's life an independent character and to look for new things to try. In opposition to this is the priority given to tradition or conformity.

On the vertical axis, 'self enhancement' is opposed to 'self transcendence.' Self-enhancement has to do with values such as exercising power, achievement and enjoying oneself. Transcending oneself is expressed in the importance attached to being helpful and forgiving and in subscribing to universal principles — including protecting the welfare of all people and protecting nature.

One of the results of these multinational studies is the relationship between the value priorities of the samples and the main characteristics of the country in which they live (Schwartz & Sagie, 2000). A comparison between countries has revealed that an increase in welfare and democratisation is accompanied by attaching more importance to openness to change ('variation,' 'self direction') and on values to do with transcending oneself ('universal principles'). Single values that indicate universalism include: 'protecting the environment,' 'unity with nature,' 'a world of beauty,' 'social justice,' and 'equality' (Schwartz, 1992). These values seem very much related to the modern idea of sustainable development, which combines issues such as nature conservation, worker protection and fair trade.

Another relevant point is the priority that people attach to 'healthy' as a value in their life. The position of 'healthy' is not displayed in Figure 2 because this value appears to have multiple meanings that vary among different groups of people (Schwartz, 1992). The importance attached to 'healthy' can be:

- A goal of personal safety ('security' in terms of Figure 2);
- A goal of enjoyment of one's body ('hedonism');
- And of health maintenance through exercise (an 'achievement' task).

Apparently, 'healthy' serves various goals, depending on how it is interpreted. These multiple meanings are also relevant for any references to 'health' in the context of health promotion.

The position of 'safety' in the context of the other values is also somewhat complicated. Schwartz (1992) used the term 'security' as a heading for personal goals of safety, harmony and stability with regard to one's society, one's relationships, and oneself. Accordingly, the term covers both family security and national security, although these might have dissimilar meanings for people from different countries. Nevertheless, it should be noted that the importance attached to 'security' goals seems to go well with 'conformity' (e.g. honouring parents and elders) and 'tradition' (e.g. respect for traditional culture).

The link between 'security' and 'conformity' might be reinforced by childhood experiences and social relationships. Many authors (Green, 1997; Janis, 1962; Turner & Pidgeon, 1997; Wolfenstein, 1957) have emphasized that children learn to deal with the dangers of the external world mainly through mediation of parental protection. As a result, rules of safety and

rules of obedience come to be strongly intertwined, and this can have positive or negative consequences for precautionary behaviour in later life. As Wolfenstein (1957) notes, people who might be in danger should pay attention to the efficacy of precautions. If it is difficult to make an assessment of efficacy, however, their adherence to safety measures may show that they are reacting more to the enforcing authorities than to the real danger. While obedience may lead to adherence, rebellion against the authorities may lead to outspoken refusal of the precautions authorities have advised.

Accordingly, it is important to examine which values go together and which values may lead to conflicting consequences. The question of how the values connected with health and safety can be combined with the values connected with openness to change is very relevant for those transformations that directly affect consumers or citizens. The combination may have two kinds of unbalanced outcomes. On the one hand, people who endorse the traditional meanings of health and safety may be extremely reluctant to accept new technologies and novel products. On the other hand, people who are eager to change their lives may completely overlook the relevance of health- and safety-related precautions.

To create room for more balanced decision-making, several solutions have been proposed in the literature (Geller, 2001; Higgins, 1997; Langer, 1989; Weick et al., 1999). From a psychological point of view, it is important to develop more positive approaches to the introduction of safety-related behaviour and to define 'safety' not only in terms of prevention of damage but also in terms of promotion of an achievement. An additional benefit of such an approach is that it might go together better with the relatively modern values of 'achievement' or even 'self-direction' (see Figure 2). The latter would be in agreement with the notion of a mindful professional who has the capacity for critical self-reflection on everything he or she does (Epstein, 1999).

Taken together, this discussion confirms the earlier point that a person's behaviour in social situations is characterised by multiple goals. It is often not feasible for people to choose just one goal in pursuit of a single value, such as safety or protecting the environment. Sooner or later, people have to find their own balance and make trade-offs. This is one of the reasons why IT should be developed and implemented in close co-operation with the people involved.

#### **4. THE IMPACTS OF AWARENESS**

Whatever values people may find important, it is essential for their achievements that they keep in touch with reality. Accordingly, the

perceptual level of awareness and interpretation is basic to the 'fit' between person and environment. That people fit into their environment is often considered a precondition for their well-being. It is also an ecologically inspired ideal that people become mindful of the many connections between their society and the larger ecological community organized around natural processes (Beatly & Manning, 1997). Such an ideal seems to be embodied in certain indigenous people who have successfully avoided ecological collapse over the long term. Their awareness of the environment might be relevant for new conceptions of sustainable management, although their way of life should not be romanticized (Whiteman & Cooper, 2000). More general insights into the role of awareness for a person-environment 'fit' have been provided by two recent psychological theories that will be discussed in this section.

The ecologically inspired ideal of a person who fits into his or her environment may be characterized in terms of sensitivity and respect. For example, an indigenous beaver trapper in northern Quebec can be seen as an ecosystem manager whose sustainable practices are based on his sensitivity to the land and his respect for animals and natural forces (Whiteman & Cooper, 2000). The trapper's notion that the ice should be respected is not only spiritually motivated but also driven by the pragmatic and experiential way in which he learns from the land. A highly comparable demonstration of sensitivity and respect can be found in a rather different environment, namely among the employees of High Reliability Organizations, such as nuclear power plants (Weick et al., 1999). Although the employees might not be equally motivated by spiritual beliefs like the trappers, they are just as mindful of unexpected changes in their environment and they show a comparably rich action repertoire in the pursuit of their goals.

More insights into the characteristics of sensitivity and respect can be derived from two recent theories on the level of awareness (Langer, 1989) and the focus of awareness (Higgins, 1997). Langer (1989) emphasizes that the mindless way in which people frequently respond to their environment is not simply a result of the fact that a more important issue dominates their attention. People can also respond mindlessly when they don't have any important issue to think about. Moreover, the difference is not just a matter of effort. Although it takes some effort to switch from mindless to mindful information processing, the latter might not really require more effort. The main difference is that mindlessness refers to passive information processing with the expectation of no change in the environment, whereas mindfulness is active information processing with the expectation that something in the environment might change. Accordingly, it is essential for people like hunters and operators to be mindful, but this mental state might be advantageous to anyone who wants to make more of his or her life.

Another relevant distinction was made by Higgins (1997), who has analysed the different ways that people 'approach' pleasure and 'avoid' pain.

His theory begins by considering what children learn about regulating pleasure and pain in interactions with their parents. What they learn is different for the two survival needs of nurturance (e.g. nourishment) and security (e.g. protection):

- Serving a nurturance need involves self-regulation with a promotion focus, sensitive to positive outcomes that might be gained (e.g. oriented to aspirations and accomplishments); and
- Serving a security need involves self-regulation with a prevention focus, sensitive to negative outcomes that have to be avoided (e.g. oriented to not making mistakes).

As a result of individual differences and momentary situations, a person may show either a promotion or a prevention focus at a given moment. With a promotion focus, the person will demonstrate eagerness to ensure the presence of positive outcomes and means of advancement; with a prevention focus he or she will show vigilance to ensure the absence of negative outcomes and mistakes (Higgins, 2000).

The distinctions regarding the level and the focus of awareness are combined in Table 1. It should be emphasized that none of the four mental states is in principle better than the others. Depending on the circumstances, each of the four might correspond with a particular ‘fit’ between person and environment. There are no objections against mindless processing if it is certain that the environment will not change. If changes or even small variations are relevant, however, mindful processing is required. Accordingly, the beaver trappers mentioned above seem to demonstrate flexible eagerness, whereas the operators of the nuclear power plant show flexible vigilance.

*Table 1:* Mental states dependent on level of awareness (Langer, 1989) and focus of awareness (Higgins, 1997).

Focus of awareness	Level of awareness	
	Mindless (no change expected)	Mindful (environment may change)
Prevention (no loss – loss)	Passive reliance on obligations	Flexible vigilance
Promotion (gain – no gain)	Passive reliance on accomplishments	Flexible eagerness

The differences between the four mental states of Table 1 are particularly relevant for the effectiveness of interventions that could lead to a behavioural change. A persuasive message with weak arguments, such as a simple request, may have a temporary effect on a person's behaviour in the sense that he or she will do what has been asked for as long as it is indeed a simple request. In that case, the person is mindlessly fulfilling a series of obligations; such as letting other people go first. In contrast, a person who is mindfully processing a request will need strong arguments.

The difference between prevention and promotion might be complicated by differences between the situation in which the message is received and the situation in which the message should be practiced. Higgins (1997) notes that campaigns for condom use have naturally framed the message in terms of safe sex and dangers to be avoided, which involve a prevention focus and the anticipation of losses. But at the critical moment when condoms will or will not be used, the partners are more likely to be experiencing a promotion focus and anticipating gains. Thus, according to Higgins (1997), messages with a promotion focus on anticipated gains (e.g., condom use promotes a caring relationship) may be more effective in this case.

A review of research relating to the effectiveness of interventions is obviously beyond the scope of this paper. Psychology offers many strategies for promoting behavioural change (Geller, 2001; Schmuck & Vlek, 2003) and each strategy can involve one or more of the processes mentioned in Figure 1, such as perceptual, rational and social processes. Various promising strategies at the perceptual and rational level rely on recent advances in computer technology. An example is research into household energy conservation through the use of newly available and affordable technologies for relaying energy feedback information during the user-system interaction (McCalley & Midden, 2002). This is an interesting way to make users mindful of the energy they use in terms of their own goals.

A recent example of how consumers may become mindless of what they are consuming is presented in Figure 3. It appears that many people are no longer aware of the animal origin of meat. This is an interesting observation, because in discussions about transformations to a more sustainable food system, protein consumption is often singled out as a crucial problem. In particular, animal protein production creates a large environmental burden, due to a biochemically inefficient conversion (Helms et al., in preparation). The fact that many people are no longer aware of the animal origin of meat is very relevant for strategies to stimulate sustainable agriculture. One interpretation of Figure 3 is that there is an increasing indifference toward the origins of proteins. This opens possibilities for novel protein foods, based on plants. However, if people are no longer aware of meat's animal origin, they will also be less inclined to pay attention to animal welfare. This may have negative consequences for attempts to stimulate sustainable agriculture by promoting high quality meat from well-treated animals. The solution will be that more attention should be paid to the segmentation of protein products in terms of bulk products and specialties.

To support sustainable development it will be extremely important to identify ways in which people feel personally related to the benefits of the environment. As Macnaghten (2003) notices, the storyline of 'global nature' under threat and in need of protection from a global community has become too simplistic. Modern Westerners do not tend to think in terms of one big environment that is the same for everyone. They want credible solutions that



give them the feeling that they are ‘doing the right thing.’ Accordingly, while for some people a promotion-oriented approach may be attractive, for others a prevention-oriented one may be preferable. In both cases, a mindful orientation to the environment is important to make people sensitive to subtle indications for a change. In modern society, this approach can only be realized if people get enough opportunities to experience the environment in a variety of ways, drawing upon their capacities for both emotional involvement and critical self-reflection.

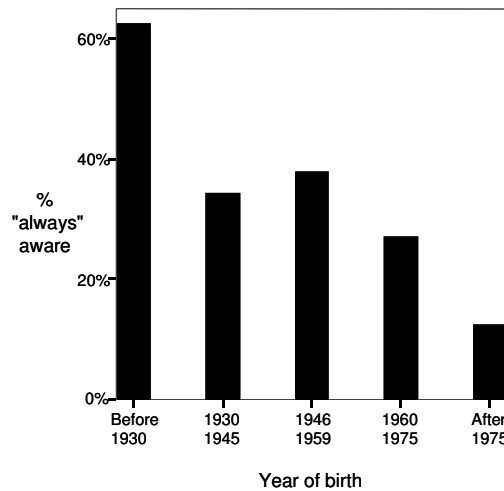


Figure 3: Percentage ‘always’ giving thought to the animal origin of meat according to year of birth (Source: sample of 313 supermarket customers [Hoogland et al., in preparation])

## 5. FINAL REMARKS

IT is not primarily a psychological process. Technical experts might change a technological system in a way that does not have to be noticed by the people who are using it. For example, the fact that meat is being used less frequently as a central part of the meal (e.g. Holm & Møhl, 2000) makes it feasible to design ready-made meals that contain less animal and more plant proteins. If the meals are being developed and prepared by retailers, and consumers can choose such a meal without thinking about the proteins, such an approach may create a substantial shift from animal to plant protein foods without much consumer involvement.

However, there are at least three reasons why such an approach is not recommendable. Firstly, there are cases in which a behavioural change can contribute to the objectives of an IT, such as doing more with fewer materials. Secondly, it is expected that values will come into conflict in many technology-related areas, such as genetically modified food. This

makes it important that all the people involved are mindful of those conflicts. And thirdly, by reinforcing mindless acceptance of technological changes people may become kind of ecological dummies, which may not be their own ideal picture of themselves.

The main message from psychologists to non-psychologists is that there are more opportunities to induce behavioural change than is commonly expected. Whether these opportunities will result in the desired end-states depends heavily on the degree to which the various determinants of behaviour can be made congruent with each other. The example of the decrease of smoking in the USA showed the combined effects of highlighting crucial dimensions of the existing culture, institutional arrangements, social norms, strong arguments to induce rational decision-making, and a straight policy to prevent mindless smoking. Accordingly, it is essential to specify as clearly as possible which behavioural change is wanted. Based on that specification, it is possible to find out which determinants of behaviour might be used for an intervention, and how they can be made congruent with each other.

In sum, the most relevant messages are:

- Human behaviour is a very flexible phenomenon, and each particular manifestation of it might be the result of many determinants;
- The determinants of behaviour can only be understood by a multi-level approach that provides insight into long-term and short-term processes;
- It makes a fundamental difference whether the consequences of behaviour are framed in a positive or negative way (e.g. losses are not just the opposite of gains);
- Interventions to aid a transformation should be developed and implemented in close co-operation with the people involved; and
- Whether an intervention will be successful depends on its contribution to a person-environment ‘fit.’

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